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Yasushi IBARAGI: *Arundinella nepalensis* var. *xerophila* (*Poaceae*): A New Variety from Mustang, Nepal

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Summary: A new variety of *Arundinella nepalensis* (*Poaceae*), var. *xerophila*, is described. This variety is different from var. *nepalensis* in leaf size, inflorescence length, callus hair length, spikelet and habitat.

*Arundinella nepalensis* Trin. is a large perennial grass and is widespread mainly in temperate regions of the Old World, from Southeast Asia to Africa (Keng 1959, Bor 1960, Sun and Phillips 2006). During taxonomic work on grasses of Nepal, some specimens resembling *A. nepalensis* but unlike any described species of this area, were found. Further taxonomic work revealed that this plant differs from other known taxa, and is here described as a new variety of *Arundinella nepalensis*.

*Arundinella nepalensis* Trin., Gram. Panic. 62 (1826).

var. *xerophila* Ibaragi, var. nov. [Figs.1, 2]

Affinis *Arundinellae nepalensi* varietati nepalensi, sed trichomatibus callo longa, inflorescentia brevi et culmo humili diversa.

**Type:** W. Nepal. Dhawalagiri Zone, Mustang

Distr.: Marpha (2660 m) – Tukche (2590 m) – Larjung (2530 m) – Koketani (2510 m) – Lower Lete (2360 m), alt. 2530m, on sunny steep slope at pathside, 27 Sep. 1995, M. Mikage & al. 9552538 (holo-TI)

Perennial. Rhizome thin, long and hard, covered by scales, up to 14 cm long, ca.1mm in diameter. Scale of rhizome ca. 8 mm long, membranous, with many nerves, glabrous or pillose. Culm solitary or few culms tuft, 7–43 cm tall, nodes glabrous. Leaf blades flat, 1–9 cm long, 1.5–4.0 mm wide, villous with long soft tubercle-based hairs on both sides. Sheath covered by soft tubercle-based hairs. Ligules membranous, 0.3–0.5 mm high, dentate on the margin, long ciliate between itself and the adjacent leaf blade. Panicle 1.2–12 cm long, bearing 1 to 10 racemes. Rhachis scabrid. Spikelet 3.5–4.5 mm long, scattered on the rachis. Lower glume 2.7–3.0 mm long, ovato-lanceolate, mucronate at apex, chartaceous, glabrous, scabous on pronounced mid nerve, 3-nerved. Upper glume nearly equaling the lower glume, chartaceous, glabrous, ovato-

Table 1. Morphological comparison between *Arundinella nepalensis* var. *nepalensis* and var. *xerophila*

	var. <i>nepalensis</i>	var. <i>xerophila</i>
Habitat	mesic area	arid area
Callus hair length*	0.4–1.5 mm	0.7–1.7 mm
Lemma/callus hair length ratio (%)	15–(34.7)–60	31.8–(56.9)–81.0
Inflorescence length	14–32 cm	1.2–12 cm
Height	101–300 cm	6.5–36 cm
Rhizome	short, thick	long, thin
Hairiness	hispidulous	hispid
Leaf blade	170–620 × 5–19 mm	10–90 × 1.5–4.0 mm

\*Callus hair length of the lemma side is measured with five spikelets from each specimen.



Fig. 1. *Arundinella nepalensis* var. *xerophila* (M. Mikage & al. 9552538, holotype, TI). Scale bar = 5 cm.

lanceolate, 5-nerved. Lower floret male; lemma ca. 3.5 mm long, lanceolate, chartaceous, glabrous, 5-nerved; palea ca. 2.0 mm long, oblong, membranous, two keeled, minutely scabrous on keels; stamens 3, anthers ca. 1.3 mm long. Upper floret hermaphrodite; lemma 2.0 mm long, oblong, chartaceous, glabrous, 5-nerved, hairy in the callus, callus hair ca. 0.8 mm long, obtuse at apex, apex awned; awn 3.0 mm long, straight; palea 2.0 mm long, oblong, two keeled; stamens 3, anthers ca. 1.7 mm long; lodicules 2, obdeltoid, 0.4 mm long.

Distribution: Nepal (Mustang Distr.).

The new variety, *Arundinella nepalensis* var. *xerophila*, differs from var. *nepalensis* in callus hair length, inflorescence length, culm height, leaf blade length, rhizome characteristics, and habitat (Table 1). The callus hairs of var. *xerophila* are usually longer than those of var. *nepalensis* (Figs. 2, 3). Additionally, the relative length to the lemma of the callus hair is longer than var. *xerophila*; i.e., the average is 56.9% for var. *xerophila* and 34.7% for var. *nepalensis* (Table 1, Figs. 2, 4). Callus hair length is used as an important characteristic for taxonomy of this genus (Sun and Phillips 2006).



Fig. 2. Upper lemma and callus hair in *Arundinella nepalensis* var. *nepalensis* (left) and var. *xerophila* (right). Scale bar = 1 mm.

Additional specimens examined:

*A. nepalensis* var. *xerophila*. **NEPAL**. Mustang District, Lete, alt. 2400 m, K. R. Rajbhandari 7886 (TI); Mustang District, Titigaon (2750 m) – Ghasa (2000 m), T. Hoshino & al. 9670150 (TI); Myadi District, Tatopani (1150 m) – Dana (1450 m) – Kopchepani (1600 m) – Mustang District, Ghasa (2000 m), alt. 1470 m, T. Hoshino & al. 9670039 (TI).

*A. nepalensis* var. *nepalensis*. **NEPAL**. between Sakyatom and Amjiresa, alt. 2200 m, K. Nishioka 908 (KYO); between Sakyatom and Amjiresa, alt. 1900 m, K. Nishioka 930, 935 (KYO); Tharpu, near Chyangthaphu, H. Hara & al. 6302109 (KYO); Hulkigaon (1240 m) – Chaurangi Phedi (550 m), alt. 870m, H. Kanai 670572 (KYO); Makwanpur Garhi – Dunge Garhi, alt. 700 m, H.

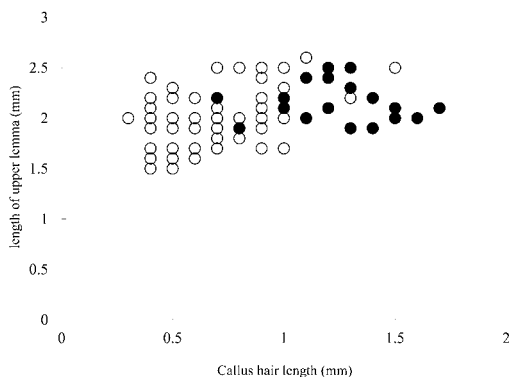


Fig. 3. Relationship between upper lemma length and callus hair length in *Arundinella nepalensis* var. *nepalensis* and var. *xerophila*. ● var. *xerophila*. ○ var. *nepalensis*.

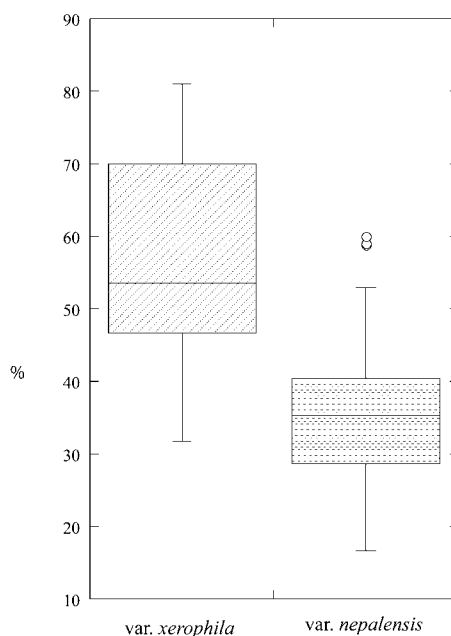


Fig. 4. Comparison of lemma/callus hair length ratio (%) in *Arundinella nepalensis* var. *nepalensis* and var. *xerophila*.

Kanai 674755 (KYO); near Dana, alt. 1250 m, K. Nishioka 477 (KYO); Phusri – Sanguri Banjang – Dhara Pani, H. Hara & al. 6302104 (KYO); en route from Chichila to Mude, Sankuwasabha District, alt. 1910 m, H. Tabata 11079 (KYO); Sinduwa, Dhankuta District, alt. 1100m H. Hara & al. 6302099 (KYO); Dhara Pani – Illam, H. Hara & al. 6302103 (KYO); near Kashara, Chitwan District, alt. 220 m, H. Tabata & al. 7587 (KYO); Between Thonje and Chamche, alt. 1700 m, J. Fujimura 13 Nov. 1953 (KYO); Sikha, alt. 3700 m, J. Kawakita 14 Oct. 1963 (KYO); Phulchoki, Kathmandu, H. Kanai and P. R. Shaky 674914 (KYO). Central Nepal, Dhaulagiri Zone, Myagdi Distr., Shika - Khipang - Paudwar - Jibang - Gaunapani - Narchang. Alt. 1800 m, M. Suzuki & al. 8881410 (TI); Koshi Zone, Dhankuta Distr., Hile - Pakhribas - Dhikure - Gorikharka - Diyale, alt. 1770 m, S. Noshiro & al. 9770023 (TI); Koshi Zone, Sankhuwasabha Distr., Sedua - a deurali - NurbuGaon, alt. 1700 m, S. Noshiro & al. 9770203 (TI); West Nepal: Dhawalagiri Zone, Myagdi and Mustang Distr. : Tatopani - Dana - Rukse Chahra - Kopchepani - Ghasa, alt. 1370 m, M. Mikage & al. 9552251 (TI); Kataunje, alt. 1200 m, K. R. Rajbhandari & al. 5389 (TI); East Nepal, Janakpurzone, H. Ohba & al. 8561192 (TI). **BHUTAN**. Tongsa - Tongsa Bridge - Tashiling, H. Hara & al. 7120 (TI). **INDIA**. Cherrapunji, Khasia hills, Assam, H. Kihara & S. Nakao, 8 Nov. 1959 (KYO); Darjeeling, Takdah, alt. 1600–1700 m, H. Hara & M. Togashi 2128

(KYO). **CHINA**. Hong kong, Lantau Island, Lantau Peak and vicinity, Y. W. Taam 1810 (KYO); Hainan, Ching Mai District. Mei Maan and vicinity, C. I. Lei 147 (KYO). **MYANMAR**. Bago Division, in border area of Rakhain State, alt. 550–575 m, T. Sugawara & al. 036365 (TKPM); Sagaing Division, along the stream to the south of Alaungdaw Kathapa National Park from the base camp, alt. 300–320 m. J. Murata & al. 032103 (TKPM); Chin State, Mt. Victoria, Namataung National Park, alt. ca. 1650–1800 m, J. Murata & al. 022863 (TKPM).

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#### ネパール・ムスタン地域産 *Arundinella nepalensis* (イネ科) の 1 新変種 (茨木 靖)

ネパール・ムスタン地域の乾燥地からイネ科トダシバ属 *Arundinella nepalensis* Trin. の 1 新変種, *Arundinella nepalensis* var. *xerophila* Ibaragi を記載し

た. 本変種は, 草丈, 葉身長, 花序長, および小穂のカルスの毛の長さで基本変種と異なる.

(徳島県立博物館)